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FULL CONTENTS CLAIM + DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS CORRECTION OR AMENDMENT

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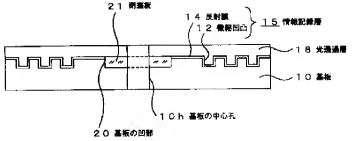
FULL CONTENTS

[Claim(s)]
[Claim 1] The blockade board which embeds this crevice at the above-mentioned crevice is inserted in using the substrate by which the crevice is formed in the periphery of a feed hole. [this photo-setting resin] by dropping a photo-setting resin at the process used as a union board, and the central part of this union board, and rotating the above-mentioned union board The manufacture method of the optical recording medium characterized by having the process which forms an optical penetration layer by making it extend and carrying out optical hardening, and the process which pierces the central part and makes a feed hole penetrate.
[Claim 2] The manufacture method of the optical recording medium according to claim 1 characterized by carrying out optical hardening simultaneously in the process which carries out rotation extension of the photo-setting resin dropped at the central part of the above-mentioned union board.
[Claim 3] The manufacture method of the optical recording medium according to claim 1 characterized by being inside the most inner circumference of the detailed unevenness from which the perimeter of the crevice of the transparent base currently formed in the periphery of the above-mentioned feed hole constitutes the Information Storage Division layer formed on the above-mentioned transparent base.
[Claim 4] The manufacture method of an optical recording medium according to claim 1 that the depth of the crevice of the transparent base currently formed in the periphery of the above-mentioned feed hole is characterized by being 0.3mm or less.
[Claim 5] The blockade board which blockades the feed hole of this board is inserted in using the substrate which has a feed hole. [this photo-setting resin] by dropping a photo-setting resin at the process used as a union board, and the central part of this union board, and rotating the above-

Drawing selection drawing 1



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mentioned union board The manufacture method of the optical recording medium characterized by having the process to extend, the process which removes the above-mentioned blockade board during rotation of a union board, and the process which forms an optical penetration layer by carrying out optical hardening of the above-mentioned photo-setting resin.
[Claim 6] The manufacture method of the optical recording medium according to claim 5 characterized by adsorbing the above-mentioned blockade board with a magnet in the process which removes the above-mentioned blockade board.
[Claim 7] The manufacture method of the optical recording medium according to claim 5 characterized by carrying out optical hardening of the above-mentioned photo-setting resin, and forming an optical penetration layer during rotation of a union board after the process which removes the above-mentioned blockade board.
[Claim 8] The level pedestal which has the function to rotate a substrate horizontally, and the blockade board which blockades the feed hole of a substrate, Manufacture equipment of the optical recording medium which serves as an electromagnet which has the function to desorb this blockade board from a substrate from a lamp, and is characterized by considering the above-mentioned electromagnet and the nozzle which trickles a liquefied photo-setting resin on a substrate as exchangeable composition.
[Claim 9] Manufacture equipment of the optical recording medium according to claim 8 characterized by the above-mentioned blockade board being a magnetic material.

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the manufacture method of an optical recording medium, and manufacture equipment.
[0002]
[Description of the Prior Art] As the object for audios, and an optical recording medium which records the object for videos, and other varieties of information Although there are optical recording media which perform the record or playback by optical irradiation, such as a ROM (Read Only Memory) type of an optical disc, an optical card, a magneto-optical disc, a phase change optical recording medium, etc., added type of a postscript, and a rewritten type For example, detailed unevenness of the phase pit where record of the data information of the Information Storage Division layer, a tracking servo signal, etc. is made in a ROM type [as / in a compact disc], a pre-groove, etc. is formed of injection molding.
[0003] With increase-izing of the amount of recording information, high recording density-ization needed to be attained and numerical aperture N. A. of the objective lens of an optical pickup needed to be enlarged as much as possible by this. Thus, when enlarging numerical aperture N.A. of an objective lens, the gap of an objective lens and the Information Storage Division layer needs to be selected small. Moreover, since the inclination tolerance of an optical recording medium decreases in this case, the optical irradiation to the Information Storage Division layer will be made from the optical penetration layer side formed on this, and the thickness of this optical penetration layer will need to be 0.5mm or less enough at smallness, for example.
[0004] The outline sectional view of read-out of recording information or the optical recording medium of composition of performing writing is shown from the optical penetration layer [which was produced by the conventional process to drawing 20] side formed on the Information Storage Division layer.
[0005] Transfer of the detailed unevenness 2 should do the optical

recording medium shown in drawing 20 at the same time it forms a substrate 1 by injection molding. Then, it has the composition which formed the reflective film 4 by aluminum vapor deposition film to the detailed unevenness 2, and formed the Information Storage Division layer 5, and a thickness of 0.5mm or less formed optical penetration layer 8 on the Information Storage Division layer 5.

[0006] The production methods of the optical recording medium shown in drawing 20 are shown below.

[0007] First, as detailed unevenness 2 is transferred simultaneously with fabrication of the substrate 1 by injection molding, next it is shown in drawing 21 The optical penetration layer 8 shown in drawing 20 is formed in the Information Storage Division layer 5 formation side side of a substrate 1 for the liquid photo-setting resin 3 from a nozzle 9 by applying circularly, extending by rotating a substrate 1 after that, and carrying out optical hardening of this.

[0008] Optical irradiation of the read-out light L performs read-out of the information from the Information Storage Division layer 5 to the optical recording medium shown in this drawing 20 from the optical penetration layer 8 side.

[0009]

[Problem to be solved by the invention] However, as mentioned above, the liquid photo-setting resin 3 on a substrate 1 for example, by carrying out spin coating circularly and carrying out optical hardening When the optical penetration layer 8 is formed, as the liquid photo-setting resin 3 inclines toward the outermost periphery on a substrate 1 by centrifugal force and this shows drawing 20 , the outermost periphery on a substrate 1 is formed more thickly than an inner circumference part, and the optical penetration layer 8 is uneven ******** to the thickness of the optical penetration layer 8.

[0010] Thus, if the thickness of the optical penetration layer 8 becomes uneven, in the case of record reproduction of the signal by the optical pickup of an optical recording medium, it will become the cause which produces the aberration of condensing spot, and degradation of a record regenerative signal will be produced.

[0011] Here, when applying a liquid photo-setting resin on a substrate, the relation between the distance (r0) from the substrate center of the application starting position of a photo-setting resin and distribution of the thickness of an optical penetration layer is shown in drawing 22 . In measuring the relation between the distance (r0) from the substrate center of the application starting position of the photo-setting resin shown in drawing 22 , and distribution of the thickness of an optical penetration layer, the distance (r0) from the substrate center of the application starting position of a photo-setting resin shows the distribution at the time of making it move at 5 (mm) gaps in 5-25 (mm). The photo-setting resin used SD-301 (made by Dainippon Ink). Moreover, the rotation pattern of the substrate at the time of carrying out rotation extension of the photo-setting resin is shown in drawing 23 .

[0012] In drawing 22 , a curve 31 expresses distribution of the thickness (micrometer) of an optical penetration layer in case the distance (r0) from the substrate center of the application starting position of a photo-setting resin is 5 (mm) here. As for a curve 32, r0 =10 (mm) and a curve 33 express r0 =15 (mm), a curve 34 expresses r0 =20 (mm), and a curve 35 expresses distribution of the thickness of each optical penetration layer at the time of r0 =25 (mm).

[0013] According to drawing 22 , it turns out that small distribution of optical penetration ****** of an inside-and-outside circumference is obtained, so that the application starting position (r0) of a photo-setting

resin goes to the inner circumference side of a substrate. For example, the difference of the thickness in the inside-and-outside circumference of an optical penetration layer in case an application starting position is 5 (mm) is set to 1 micrometer or less to the difference of the thickness in the inside-and-outside circumference of an optical penetration layer in case an application starting position is 20 (mm) being 7 micrometers or more. Thus, the application starting position of a photo-setting resin is further brought to the inner circumference side of a substrate, when it is applying a photo-setting resin from the central part of a substrate, a film thickness difference twists a theory top and a plane optical penetration layer will be obtained completely.

[0014] However, an optical recording medium especially [in the case of an optical disc] Since there was a press slot by the stamper for detailed unevenness transfer produced on the occasion of the feed hole of a disk and injection molding of a substrate, the application starting position of the photo-setting resin could not be made into the central part of a substrate, but the outside of the press slot on the stamper was the limit of the application starting position of a photo-setting resin. For this reason, unevenness was to arise in the thickness of an optical penetration layer.

[0015] Then, in this invention, the optical recording medium which avoided effectively as unevenness arose in the thickness of an optical penetration layer by the ability making the application starting position of the photo-setting resin on a substrate at the time of forming an optical penetration layer into the central part of a substrate is produced.

[0016]

[Means for solving problem] This invention inserts in the crevice of a substrate the blockade board which embeds a crevice and is blockaded using the substrate by which the crevice is formed in the periphery of a feed hole. By considering it as a union board and a photo-setting resin being dropped at the central part of this union board, and extending a photo-setting resin by rotating a union board, and carrying out optical hardening, form an optical penetration layer, pierce the central part, a feed hole is made to penetrate, and an optical recording medium is produced.

[0017] Moreover, by inserting a blockade board in the feed hole of a substrate, considering it as a union board, a photo-setting resin being dropped at the central part of this union board, and carrying out rotation extension, removing a blockade board during rotation of a union board, and carrying out optical hardening of the photo-setting resin, this invention forms an optical penetration layer and produces an optical recording medium.

[0018] Since according to this invention spin coating of the photo-setting resin is dropped and carried out to the central part of a substrate and an optical penetration layer is formed in it by [the] carrying out crepuscular-rays hardening, the very small namely, optical recording medium with small thickness unevenness of thickness distribution of the optical penetration layer of the inside-and-outside circumference of a substrate is producible.

[0019]

[Mode for carrying out the invention] The form of concrete operation of this invention is explained. Although the case where it applies to the shape of a disk and what is called a disc-like optical disc below is explained [this invention] by not being restricted to such an optical disc, having a magneto-optical disc, a phase change disk, and other detailed unevenness in the Information Storage Division layer, and carrying out focusing of the light to the Information Storage Division layer through an optical penetration layer If reproduction of information or record is performed, it is applicable about anythings.

[0020] This invention obtains the optical recording medium of

composition of being shown, for example in drawing 1 . Namely, the optical recording medium shown in drawing 1 transfers detailed unevenness 12 simultaneously with fabrication of a substrate 10. Then, it has the composition which formed the reflective film 14 by aluminum vapor deposition film to the detailed unevenness 12, and formed the Information Storage Division layer 15, and a thickness of 0.5mm or less formed optical penetration layer 18 on the Information Storage Division layer 15.

[0021] The production methods in this invention of the optical recording medium shown in drawing 1 are shown below.

[0022] In this example, the blockade board 21 which embeds a crevice 20 and is blockaded is inserted in the crevice 20 of a substrate using the substrate 10 by which the crevice is formed in the periphery of 10h of feed holes. By considering it as a union board and a photo-setting resin being dropped at the central part of this union board, and extending a photo-setting resin by rotating a union board, and carrying out optical hardening, form the optical penetration layer 18, pierce the central part, 10h of feed holes are made to penetrate, and an optical recording medium is obtained.

[0023] First, the substrate 10 by which the crevice is formed in the periphery of a feed hole is produced. Drawing 2 is the outline sectional view of an example of substrate production equipment. In this example, for example by injection molding of light transmittance state resin, such as polycarbonate, a substrate 10 is fabricated, simultaneously with fabrication of a substrate 10, the detailed unevenness 12 which constitutes the Information Storage Division layer 15 is formed, and the crevice 20 of a substrate is further formed in a substrate 10.

[0024] The substrate production equipment shown in drawing 2 has metallic mold equipment 53 which consists of a substrate side metallic mold 51 which constitutes the cavity 50 for fabricating a substrate 10, and which consists of stainless steel system metal, for example, and a stamper side metallic mold 52. The stamper side metallic mold 52 is connected with the gate 80 of the light transmittance state resin transmitting mechanism 90 which sends out the light transmittance state resin fused in the cavity 50.

[0025] Light transmittance state resin is sent out to a gate 80 by forming Screw 40s in the light transmittance state resin transmitting mechanism 90, and making it rotate this screw 40s.

[0026] The substrate feed hole punching pin 51a for finally piercing and forming 10h of feed holes of the forming board 10 in the central part is arranged at the substrate side metallic mold 51.

[0027] The metallic mold 40 with **** which forms the crevice 20 of the substrate 10 which it is arranged with a vacuum chuck method, and is finally obtained is arranged for the stamper 7 which transfers the detailed unevenness 12 which constitutes the Information Storage Division layer 15 of a substrate 10 at the stamper side metallic mold 52 used in fabrication of a substrate 10.

[0028] In the necessary position of the substrate 10 finally obtained in the metallic mold 40 with ****, and the example of illustration, it is the periphery of 10h of feed holes of the information signal formation side of a substrate 10. **** 40a for crevice formation of the shape of a ring of the necessary size for forming a crevice 20 in the coldhearted news record section of the position inside the Information Storage Division layer formation area over all the circumferences is formed.

[0029] And to 40h of feed holes of the metallic mold 40 with **** of the central part of the metallic mold 40 with ****, a gate 80 is open for free passage. Moreover, 7h of feed holes where the convex part 40a of the metallic mold 40 with **** is inserted are drilled in the central part of the stamper 7.

[0030] How to fabricate a substrate 10 is explained using this substrate production equipment.
[0031] First, the substrate side metallic mold 51 and the stamper side metallic mold 52 are made to agree, and a cavity 50 is formed among both. In this state, light transmittance state resin, for example, melting polycarbonate, is sent into a gate 80 by rotating Screw 40s. Heat will be radiated and light transmittance state resin will be solidified, if it is poured in in a cavity 50 through 40h of feed holes of the metallic mold 40 with **** after passing through a gate 80. Next, push out the substrate feed hole punching pin 51a, it is made to project, 10h of feed holes of a substrate are formed, and a substrate 10 is obtained.
[0032] Thus, as shown in drawing 3 , it is the periphery of 10h of feed holes of a substrate, and the substrate 10 by which **** 40a for crevice formation was transferred by the coldhearted news record section of the position inside the Information Storage Division layer formation area, and the crevice 20 was formed in it is fabricated.
[0033] As for 30 (mm) and the depth, it is desirable that it is below 0.3 (mm), for example, the crevice 20 of this substrate 10 can select that perimeter to 0.2 (mm), if the path of the feed hole of a substrate 10 is set to 15 (mm).
[0034] Next, the reflective film 14 by aluminum vapor deposition film is put on the detailed unevenness 12 formed simultaneously with injection molding of a substrate 10 on the substrate 10, for example, and the Information Storage Division layer 15 is formed in it.
[0035] Next, the blockade board 21 which embeds at the crevice 20 of a substrate and is blockaded is prepared. As it is considered as circle form and shown in drawing 4 , the blockade board 21 which it is desirable considering it as a circular crevice as for the crevice 20 of a substrate 10, embeds this in this case, and is blockaded inserts the blockade board 21 in the crevice 20 of a substrate 10, and forms the union board 25. This blockade board 21 is produced by the same material as a substrate 10, for example, polycarbonate. And the path of the blockade board 21 is selected corresponding to the diameter of inner circumference of the crevice 20 of a substrate 10, and is selected by the size exactly inserted in in a crevice 20. Moreover, the thickness of this blockade board 21 is in the state inserted in in the crevice 20 of a substrate. It is the same as the depth of a crevice 20, or slightly larger than the depth of the crevice 20 of a substrate, therefore when it inserts in a crevice 20, it selects so that it may project more slightly than a substrate side, so that the surface may form the same plane as a substrate side.
[0036] Next, as shown in drawing 5 , the liquefied photo-setting resin 3 is dropped by a nozzle 9 on the center of the blockade board 21 inserted in the crevice 20 of a substrate 10 in the central part of a substrate 10, i.e., this case.
[0037] Next, as shown in drawing 6 , the high velocity revolution of the substrate 10 is carried out, and the liquefied photo-setting resin 3 is extended. At this time, by the ultraviolet-rays irradiation by a luminous source 22, optical hardening of the liquefied photo-setting resin 3 can be performed, and, simultaneously with extension of the liquefied photo-setting resin 3 by rotation of a substrate 10, the optical penetration layer 18 finally obtained can be produced.
[0038] Thus, by having had composition which inserted the blockade board 21 in the crevice 20 of a substrate 10 From the central part of a substrate 10, as the photo-setting resin 3 can be dropped now and the measurement result which this explained in above-mentioned drawing 22 was shown, the thickness of the optical penetration layer 18 can be formed uniformly.
[0039] Next, as shown in drawing 7 , the feed hole punch machine 71 is

inserted from the central part of a substrate 10. The optical penetration layer 18 and the blockade board 21 which were made to carry out optical hardening and formed the blockade board 21 and the photo-setting resin 3 are pierced, it can be made to be able to penetrate, 10h of feed holes of a substrate 10 can be formed, and the optical recording medium finally made into the purpose can be obtained.

[0040] moreover, in making the central part of a substrate 10 penetrate and forming 10h of feed holes of a substrate 10 As shown in drawing 8 , from the optical penetration layer 18 formation side side of a substrate 10, the feed hole punch machine 71 is driven in, the optical penetration layer 18 and a blockade board are pierced, it can be made to be able to penetrate and 10h of feed holes of a substrate 10 can also be formed.

[0041] By taking the method of applying the photo-setting resin 3, making carry out [in / as mentioned above / the making process of the optical penetration layer 18] rotation extension in the state where 10h of feed holes of the substrate 10 were made to blockade with the blockade board 21, and carrying out optical hardening The very small optical recording medium of thickness distribution of the optical penetration layer 18 which performs read-out or the writing of information from the Information Storage Division layer 15 is producible.

[0042] Next, other work examples which produce the optical recording medium of the very small namely, uniform thickness of thickness distribution of an optical penetration layer are explained with reference to drawing 9 - drawing 15 .

[0043] The schematic diagram of the manufacture equipment of the optical recording medium of this invention is shown in drawing 9 . The level pedestal 100 which the manufacture equipment of this optical recording medium has the main axis 101 penetrated to the feed hole of a substrate, and has a rotation function for this main axis horizontally as a center, It becomes the blockade board 121 which blockades 10h of feed holes of a substrate, and the electromagnet 102 which can desorb this blockade board 121 from a substrate 10 from the lamp L for hardening a photo-setting resin.

[0044] From the bore of 10h of feed holes of a substrate, this blockade board 121 has the outer diameter as for which size becomes, and the projection supporter 121a inserted in 10h of feed holes is formed in that undersurface, and it changes. As for the blockade board 121 or the projection supporter 121a, a part of either [at least] is constituted by the magnetic substance at least. For example, the blockade board 121 can apply and constitute a magnetic material to the resin board which constituted with the magnetic metal plate or was produced, for example by injection molding. This blockade board 121 sets that thickness to 0.1mm or less preferably about 0.3mm or less.

[0045] Moreover, as it is indicated in drawing 15 as this electromagnet 102 and the nozzle 9 which trickles a liquefied photo-setting resin on a substrate 10, it has exchangeable composition.

[0046] For example, as structure of making one rotating a nozzle 9 and an electromagnet 102 on the axis-of-rotation part 131, it takes the place, and a nozzle 9 and an electromagnet 102 have in the central part of a substrate 10, and are made to be caused. On the other hand, it is made as [convey / by the conveyance means 130 / two or more substrates 10].

[0047] Moreover, anything of the form of circular and linearity can be used for the form of Lamp L. This lamp L is arranged rather than the blockade board 121 at the perimeter side of a substrate 10, and is arranged in the position in which optical irradiation is possible enough also at the outermost periphery of the substrate 10.

[0048] An optical recording medium is produced using above-mentioned this invention equipment. First, as shown in drawing 10 , one substrate 10

turns the Information Storage Division layer up, and is conveyed by the conveyance means 130 above the level pedestal 100. And while the level pedestal 100 goes up and the main axis 101 is inserted all over the feed hole 10h of a substrate 10, it does not illustrate, but adsorption installation of the substrate 10 is carried out on the level pedestal 100 by the vacuum chuck prepared in the level pedestal 100.

[0049] While the blockade board 121 by which the electromagnet 102 was adsorbed has above the central part of the substrate 10 on the level pedestal 100 on the other hand at this time, being caused and inserting that projection supporter 121a into the feed hole 10h of a substrate, the blockade board 121 attaches to the upper end face of 10h of feed holes of a substrate, and blockades this. And where this blockade is made, the energization to an electromagnet 102 is severed, after the blockade board 121 has blockaded 10h of feed holes of a substrate 10, it unites, and the union board 125 is constituted.

[0050] Next, as shown in drawing 11 , an electromagnet 102 is moved, the nozzle 9 which supplies a photo-setting resin instead is installed above a substrate 10, and a photo-setting resin is dropped at the central part of the union board 125 from a nozzle 9.

[0051] Then, a nozzle 9 is moved and an electromagnet 102 is instead installed above a substrate 10 again.

[0052] Next, as shown in drawing 12 , the extension application of the photo-setting resin dropped on this union board 125 is uniformly carried out by rotating the rotation pedestal 100 for the union board 125.

[0053] Then, as shown in drawing 13 , the blockade board 121 is adsorbed with an electromagnet 102 during rotation of the union board 125, and it removes from the union board 125.

[0054] Next, as shown in drawing 14 , optical hardening of the photo-setting resin is carried out with Lamp L, and the optical penetration layer which constitutes the optical recording medium finally obtained is formed.

[0055] The process mentioned above can be continuously performed repeatedly by having a substrate 10 on the level pedestal 100 one by one, and causing it by the conveyance means 130, as drawing 15 explained. And according to above-mentioned composition, the migration shift of the nozzle 9 which carries out supply dropping of the photo-setting resin, and the electromagnet 102 which performs adsorption and desorption of the blockade board 121 can be quickly carried out on the central part of a substrate 10 by having considered it as the structure rotated to one.

[0056] [the board] in an above-mentioned work example although what applied magnetic powder to the metal plate about 0.3mm thick and the resin board produced by carrying out injection molding of the photo-setting resin, for example can be used for the blockade board 121 shown in drawing 9 Since it is necessary to use this blockade board 121 repeatedly, the intensity which can be equal to repetition use is required. For this reason, it is necessary to make this blockade board 121 to some extent thick.

[0057] Then, as shown in drawing 17 if Crevice 10a is beforehand formed on the outskirts of the central part of a substrate 10 as shown in drawing 16 Since it can avoid that the blockade board 121 projects too much from a substrate also when a substrate 10 and the blockade board 121 are made to agree and a union board is formed, the to some extent thick blockade board 121 can be used. However, it is desirable in the depth of the crevice 10a of this substrate being selected in this case more shallowly than the thickness of the blockade board 121. For example, if the thickness of a substrate 10 shall be 1.2mm and the depth of the substrate crevice 10a shall be 0.3mm, the thickness of the blockade board 121 can be about 0.4mm.

[0058] Moreover, by attaching an O ring or packing to the contact part of the blockade board 121 and a substrate 10 in the work example mentioned above, as shown in drawing 18 It can prevent that a photo-setting resin invades between a substrate 10 and the blockade board 121, and, thereby, the application unevenness of a photo-setting resin and the poor appearance of an optical recording medium which are finally acquired can be avoided.

[0059] Moreover, if it changes into the state where line contact was carried out to the side wall part of 10h of feed holes of a substrate when the side of the blockade board 121 is made into tapered shape and 10h of feed holes of a substrate 10 are embedded, as shown in drawing 19 Since a crevice is not made between a substrate 10 and the blockade board 121, invasion of a photo-setting resin is avoidable.

[0060] Although the reflective film 14 of the Information Storage Division layer 15 which constitutes the optical recording medium of this invention was formed with aluminum vapor deposition film in the above-mentioned work example, this invention is not limited to this example and metal, such as Au, can also apply it.

[0061] Moreover, although the case where the optical recording medium of layer structure was produced was explained in the work example mentioned above [this invention] by adding the process which makes the stamper for detailed unevenness transfer which constitutes the Information Storage Division layer agree, after applying the photo-setting resin 3 on the above-mentioned substrate 10, and making an optical penetration layer form like the work example further mentioned above after that It can apply, when producing the optical recording medium of two-layer structure or the multilayer structure which has the Information Storage Division layer more.

[0062]

[Effect of the Invention] According to this invention, read-out of the recording information from the Information Storage Division layer of an optical recording medium, Or since it can be made to form in the center of a substrate through the process which dropped and carries out rotation extension when forming the optical penetration layer which writes in information by carrying out optical hardening of the liquefied photo-setting resin, Optical penetration **** could be thinly formed in uniform thickness, and high recording density-ization of the optical recording medium was able to be attained.

[0063] Moreover, while extending the liquefied photo-setting resin by rotation of the substrate, it was effectively avoidable by stiffening a photo-setting resin by optical irradiation that distribution arises in the thickness of the optical penetration layer from which a photo-setting resin is finally obtained with the surface tension.

[0064] Moreover, it was avoidable to produce a defect in the Information Storage Division layer by forming inside the most inner circumference of the detailed unevenness which constitutes the Information Storage Division layer formed on the substrate in the perimeter of the crevice of a substrate.

[0065] moreover, the thickness of the blockade board for embedding the crevice of a substrate -- the depth of the crevice of a substrate, and abbreviation -- by same or making it form more thickly than the depth of a crevice In the state where the blockade board was embedded at the substrate, when applying a liquefied photo-setting resin and extending by this that it will be in the state where the central part of the substrate became depressed by the ability avoiding, the substrate central part was covered with the liquefied photo-setting resin, and it was able to avoid that it will be in the state where extension is barred.

[0066] Moreover, the thickness of the blockade board 21 which embeds

the crevice of a substrate can be set up thinly, and it was able to make it possible to pierce the feed hole of a substrate easily by this by selecting the depth of the crevice of a substrate below to 0.3 (mm).

[0067] Moreover, the making process of an optical recording medium can be performed now more simply and quickly by inserting in the feed hole of a substrate and desorbing a blockade board during rotation of a union board using the material which has magnetism as a blockade board which blockades this.

[0068] Moreover, according to the manufacture equipment of the optical recording medium of this invention, the optical penetration layer which constitutes an optical recording medium was able to be formed in thin and uniform thickness simply and quickly.

[Brief Description of the Drawings]

[Drawing 1] The outline sectional view of the optical recording medium produced by this invention method is shown.

[Drawing 2] The schematic diagram of substrate production equipment is shown.

[Drawing 3] The outline sectional view of a substrate is shown.

[Drawing 4] The making process figure of a union board is shown.

[Drawing 5] The making process figure of an optical penetration layer is shown.

[Drawing 6] The making process figure of an optical penetration layer is shown.

[Drawing 7] The process chart which pierces and produces the feed hole of a substrate is shown.

[Drawing 8] The process chart of other examples which pierce and produce the feed hole of a substrate is shown.

[Drawing 9] The 1 manufacturing-process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 10] The 1 manufacturing-process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 11] The 1 manufacturing-process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 12] The 1 manufacturing-process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 13] The 1 manufacturing-process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 14] The 1 manufacturing-process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 15] The schematic diagram of the manufacture equipment of the optical recording medium by this invention method is shown.

[Drawing 16] The manufacturing process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 17] The manufacturing process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 18] The manufacturing process figure of other examples of the optical recording medium by this invention method is shown.

[Drawing 19] The making process figure of other examples of a basing-on this invention method optical recording medium is shown.

[Drawing 20] The outline sectional view of the optical recording medium produced by the conventional method is shown.

[Drawing 21] The 1 manufacturing-process figure of the optical recording medium by the conventional method is shown.

[Drawing 22] The related figure of the distance from the substrate center of the application starting position of a photo-setting resin and the thickness of an optical penetration layer is shown.
[Drawing 23] The rotation pattern of the substrate at the time of carrying out rotation extension of the photo-setting resin is shown.
[Explanations of letters or numerals]
1, 10 A substrate, 1h, 10h The feed hole of a substrate, 2, 12 Detailed unevenness, 3 Photo-setting Resin, 4, 14 Reflective Film, 5, 15 Information Storage Division Layer, 7 Feed Hole of Stamper and 7H Stamper, 8, 18 Optical Penetration Layer, 9 Nozzle, 20 Crevice of Substrate, 21,121 Blockade Board, 22 Luminous Source, 25,125 A union board, 31 Distribution of the thickness of an optical penetration layer in case the application starting position of a photo-setting resin is 5 (mm), 32 Distribution of Thickness of Optical Penetration Layer in case Application Starting Position of Photo-setting Resin is 10 (Mm), 33 Distribution of Thickness of Optical Penetration Layer in case Application Starting Position of Photo-setting Resin is 15 (Mm), Distribution of the thickness of an optical penetration layer in case the application starting position of 34 photo-setting resins is 20 (mm), 35 Distribution of Thickness of Optical Penetration Layer in case Application Starting Position of Photo-setting Resin is 25 (Mm), 40 Metallic Mold with ****, 40a **** for Crevice Formation, 40H Feed Hole of Metallic Mold with ****, 40s A screw, 50 A cavity, 51 The substrate side metallic mold, 51a A substrate feed hole punching pin, 52 The stamper side metallic mold, 53 Metallic mold equipment, 70, 71 A feed hole punch machine, 80 A gate, 90 A light transmittance state resin transmitting mechanism, 100 Level pedestal, 101 Main Axis, 102 Electromagnet, 121a Projection Supporter, 130 Conveyance Means, 131 Axis-of-Rotation Part

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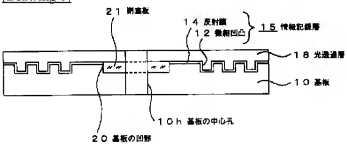
[Drawing 1]



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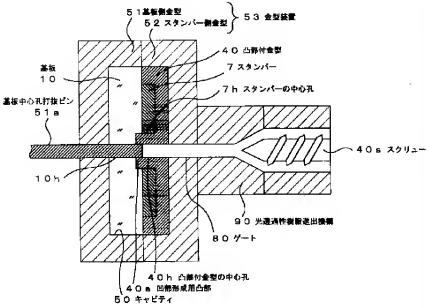

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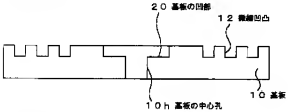

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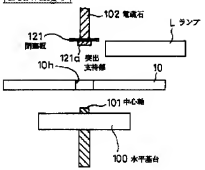

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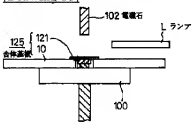

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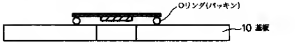

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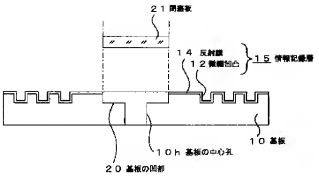

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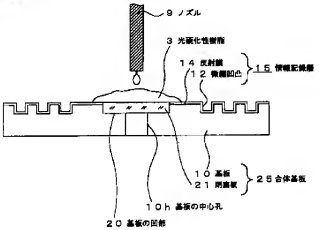

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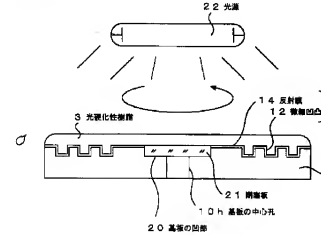

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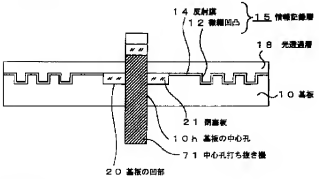

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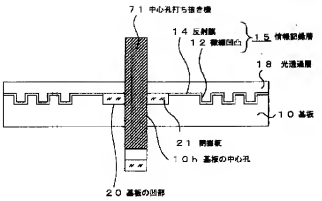

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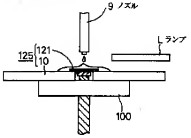

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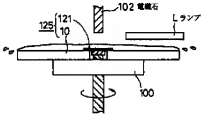

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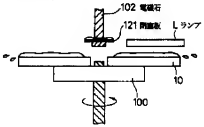

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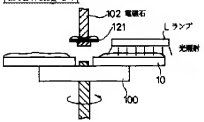

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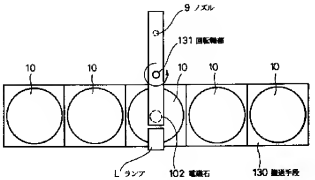

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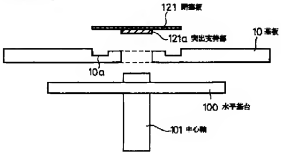

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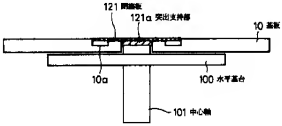

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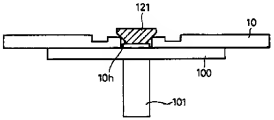

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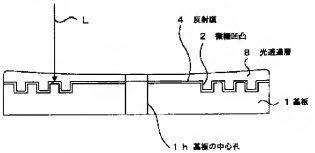

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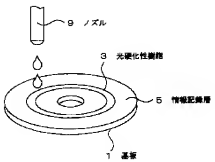

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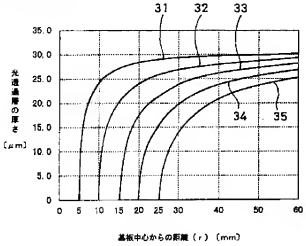

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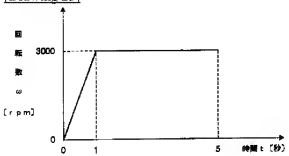

[Translation done.]

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